AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A color conversion relation derivation method of deriving a color conversion relation between a first color space and a second color space, the color conversion relation derivation method comprising:

an area forming step that forms a plurality of areas filling the first color space such that the plurality of areas are arranged in lattice configuration and partially overlay each other in the first color space;

a partial function derivation step that derives, for each of the areas formed in the area forming step, a coefficient of a partial function representative of a color conversion between coordinates in the area and coordinates of the second color space using a set of an arbitrary sample point provided in the first color space and a point in the second color space, which is associated with the sample point; and

a whole function derivation step that, in a range that the areas are overlapped with each other, combines the partial functions by obtaining a coefficient interpolated by the coefficient of the partial function for each of the overlapped areas and by deriving a function represented by the interpolated coefficient, ~~for the respective areas derived by the partial function derivation step to~~ and derives~~derive~~ a whole function representative of the color conversion relation through the first color space in its entirety.

2. (currently amended): The color conversion relation derivation method according to claim 1, wherein the area forming step forms, as the plurality of areas, a plurality of areas overlapping with one another in coordinates of the first color space, and

the whole function derivation step combines the partial functions in a range that the areas are overlapped with one another.

3. (currently amended): A color conversion relation derivation apparatus for deriving a color conversion relation between a first color space and a second color space, the color conversion relation derivation apparatus comprising:

an area forming section that forms a plurality of areas filling the first color space such that the plurality of areas are arranged in lattice configuration and partially overlay each other in the first color space;

a partial function derivation section that derives, for each of the areas formed in the area forming section, a coefficient of a partial function representative of a color conversion between coordinates in the area and coordinates of the second color space using a set of an arbitrary sample point provided in the first color space and a point in the second color space, which is associated with the sample point; and

a whole function derivation section that, in a range that the areas are overlapped with each other, combines the partial functions ~~for the respective areas derived by the partial function derivation section to derive~~ by obtaining a coefficient interpolated by the coefficient of the partial function for each of the overlapped areas and by deriving a function represented by the interpolated coefficient, and derives a whole function representative of the color conversion relation through the first color space in its entirety.

4. (currently amended): A color conversion relation derivation program storage medium storing a color conversion relation derivation program which causes a computer to operate as a color conversion relation derivation apparatus, when the color conversion relation derivation program is incorporated into the computer and is executed, the color conversion relation derivation apparatus comprising:

an area forming section that forms a plurality of areas filling the first color space such that the plurality of areas are arranged in lattice configuration and partially overlay each other in the first color space;

a partial function derivation section that derives, for each of the areas formed in the area forming section, a coefficient of a partial function representative of a color conversion between coordinates in the area and coordinates of the second color space using a set of an arbitrary sample point provided in the first color space and a point in the second color space, which is associated with the sample point; and

a whole function derivation section that, in a range that the areas are overlapped with each other, combines the partial functions by obtaining a coefficient interpolated by the coefficient of the partial function for each of the overlapped areas and by deriving a function represented by the interpolated coefficient, and derives ~~for the respective areas derived by the partial function derivation section to derive~~ a whole function representative of the color conversion relation through the first color space in its entirety.

5. (previously presented): The color conversion relation derivation method according to claim 1, wherein each area formed by the area forming step is of equal size.

6. (previously presented): The color conversion relation derivation method according to claim 1, wherein the area forming step separates the first color space into a plurality of sections, wherein the plurality of areas are formed in the plurality of sections.

7. (currently amended): A method of deriving a color conversion relation between a first color space and a second color space, comprising:

an area defining step that separates the first color space into a plurality of areas such that the plurality of areas are arranged in lattice configuration and partially overlay each other in the first color space;

a partial function derivation step that derives, for each area defined by the area defining step, a coefficient of a partial function representative of a color conversion between the coordinates of the area of the first color space and corresponding coordinates of the second color space; and

a whole function derivation step that, in a range that the areas are overlapped with each other, combines the partial functions by obtaining a coefficient interpolated by the coefficient of the partial function for each of the overlapped areas and by deriving a function represented by the interpolated coefficient, and derives ~~of each said area to derive~~ a whole function representative of the color conversion relation between the entire said first color space and the second color space.

8. (previously presented): The method of claim 7, wherein the areas defined by the area defining step are of equal size.

9. (previously presented): The method of claim 7, wherein the area defining step separates the first color space into a plurality of sections, wherein the plurality of sections are separated into the plurality of areas.

10. (previously presented): The method of claim 7, wherein the whole function derivation step combines the partial functions of areas which are adjacent to each other in the first color space.

11. (previously presented): The method of claim 10, wherein the adjacent areas are overlapping.

12. (previously presented): The apparatus of claim 3, wherein the partial function derivation section comprises determining a weighted function of the set of arbitrary sample points to a point overlapping each of the plurality of areas.

13. (cancelled).

14. (new): The color conversion relation derivation method according to claim 1, wherein the area defining step assigns a plurality of divisional points to a lattice, thereby forming the plurality of areas filling the first color space.

15. (new): The apparatus of claim 3, wherein the area forming section assigns a plurality of divisional points to a lattice, thereby forming the plurality of areas filling the first color space.

16. (new): A method of deriving a color conversion relation between a first color space and a second color space, comprising:

an area defining step that assigns a plurality of divisional points to a lattice, thereby separating the first color space into a plurality of areas;

a partial function derivation step that extracts one or more lattice points from each of the areas and derives, for each area defined by the area defining step, a partial function representative of a color conversion between lattice points of the area of the first color space and corresponding points of the second color space; and

a whole function derivation step that combines the partial functions of each said area to derive a whole function representative of the color conversion relation between the entire said first color space and the second color space.

17. (new): The method of claim 16, wherein the plurality of divisional points are evenly spaced throughout the first color space.

18. (new): The color conversion relation derivation method according to claim 1, wherein the partial function is a polynomial expression of the first color space.

19. (new): The color conversion relation derivation method according to claim 18, wherein the whole functions is a smoothing function to join each polynomial expression with at least one other polynomial expression.

20. (new): The color conversion relation derivation method according to claim 18, wherein the polynomial function is at least a second order polynomial function.

21. (new): The color conversion relation derivation method according to claim 20, wherein the whole functions is a smoothing function to join each polynomial expression with at least one other polynomial expression.

22. (new): The color conversion relation derivation method according to claim 1, wherein the partial function derivation step is a step to derive the coefficient of the partial function in the area by a coefficient least square method in which the sample point in the first color space is weighted in accordance with a distance from a center of the area.

23. (new): The color conversion relation derivation method according to claim 1, wherein the partial function derivation step is a step to derive the coefficient of the partial function by weighing accordance with a distance from a position representative of gray in the first color space.